WHAT IS CLAIMED IS:

1. A method of forming a trench in a semiconductor device, comprising:

forming a polish stop layer on a semiconductor substrate;

etching the polish stop layer and etching the semiconductor substrate to a predetermined depth to form a trench such that ends of the polish stop layer adjacent to the trench are rounded; and

forming an insulation layer that fills the trench.

2. The method of claim 1, wherein etching is performed such that following the injection of one of CHF_3, CF_4, O_2, HeO_2, and Ar, plasma is created and dry etching is performed.

3. The method of claim 2, wherein the etching is performed by injecting one of at most 60sccm of CHF_3 gas, at most 60sccm of CF_4 gas, at most 30sccm of O_2 gas, at most 60sccm of HeO_2 gas, and at most 200sccm of Ar gas.

4. The method of claim 2, wherein 50-500W of power is applied to generate plasma in a state where one of CHF_3, CF_4, O_2, HeO_2, and Ar is injected.

5. The method of claim 2, wherein a pressure environment of 5-100mTorr is created for use during etching.

6. The method of claim 1, further comprising, prior to forming a polish stop layer on a semiconductor substrate:

forming an anti-reflection coating on the polish stop layer; and

selectively etching the anti-reflection coating to form an anti-reflection coating pattern,

wherein an area of the polish stop layer exposed through the anti-reflection coating pattern and the semiconductor substrate to a predetermined depth are etched to form the trench, and ends of the anti-reflection coating pattern and ends of the polish stop layer under the ends of the anti-reflection coating pattern are etched such that the ends of the anti-reflection coating are formed into a rounded configuration.

8. The method of claim 7, wherein the etching is performed such that following the injection of one of CHF_3, CF_4, O_2, HeO_2, and Ar, plasma is created and dry etching is performed.

9. The method of claim 8, wherein the etching is performed by injecting one of at most 60sccm of CHF_3 gas, at most 60sccm of CF_4 gas, at most 30sccm of O_2 gas, at most 60sccm of HeO_2 gas, and at most 200sccm of Ar gas.

10. The method of claim 8, wherein 50-500W of power is applied to generate plasma in a state where one of CHF_3, CF_4, O_2, HeO_2, and Ar is injected.

11. The method of claim 8, wherein a pressure environment of 5-100mTorr is created for use during etching.

12. The method of claim 1, wherein the polish stop layer is deposited to a thickness of 1000-3000Å.

13. The method of claim 1, wherein the polish stop layer is made of a material

that is more slowly polished than insulation material of the insulation layer.

14. The method of claim 13, wherein the polish stop layer is formed of a silicon nitride layer deposited to a thickness of 1000-3000Å.

15. The method of claim 14, wherein etching is performed such that following the injection of one of CHF_3, CF_4, O_2, HeO_2, and Ar, plasma is created and dry etching is performed.

16. The method of claim 15, wherein the etching is performed by injecting one of at most 60sccm of CHF_3 gas, at most 60sccm of CF_4 gas, at most 30sccm of O_2 gas, at most 60sccm of HeO_2 gas, and at most 200sccm of Ar gas.

17. The method of claim 15, wherein 50-500W of power is applied to generate plasma in a state where one of CHF_3, CF_4, O_2, HeO_2, and Ar is injected.

18. The method of claim 15, wherein a pressure environment of 5-100mTorr is created for use during etching.

19. The method of claim 1, wherein during forming an insulation layer that fills the trench, following the formation of the insulation layer to cover the polish stop layer and inner walls of the trench, chemical-mechanical polishing is performed on the insulation layer until the polish stop layer is exposed.

20. The method of claim 1, wherein prior to forming the insulation layer, a liner oxidation layer is formed on the polish stop layer and the trench, then the insulation layer is formed on the liner oxidation layer such that the trench is filled with a material

forming the insulation layer.